related standards efforts are adequate for promoting the timely implementation of PCS."[61] The Commission should encourage industry efforts to develop standards that will support various technologies. As Northern Telecom recommended, "[t]he Commission should monitor the ongoing work of industry committees, and incorporate the results as necessary . . . ."[62]

D. Technical Regulations for Unlicensed PCS Devices Should be Left to Industry Standards Groups

Opening comments evidence a strong consensus that the Commission should not constrict the development of unlicensed PCS by mandating unnecessary technical regulations.[63] The North American Telecommunications Association has noted that leaving these decisions to the industry "will avoid bogging down these proceedings in disputes over whose technologies should be favored by the Commission's rules."[64] All of the affected manufacturers, as well as Telocator, support development of industry-derived spectral etiquettes to ensure sharing between

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[61] Sprint at A1.

[62] Northern Telecom at 33.

[63] Comments of California Microwave, Inc. at 2-3 ("California Microwave"); Comments of Hewlett-Packard Company at 2 ("Hewlett-Packard"); Matsushita at 6; McCaw at 40-42; Metrocall at 20; USTA at 36-37; UTC at 20; Comments of North American Telecommunications Association at 9 ("North American Telecommunications Association"); Comments of the Wireless Information Networks Forum at 12 ("WINForum").

[64] North American Telecommunications Association at 9.

unlicensed devices.[65] The comments of WINForum recommend that "[t]he Commission utilize this [industry-derived] Etiquette in adopting minimal technical rules sufficient to ensure fair access to, and efficient utilization of, the unlicensed spectrum by equipment from any vendor."[66]

Similarly, a significant number of commenters have endorsed Telocator's position that channelization of 1910-1930 MHz should be left flexible so industry can develop technologies and standards.[67] The concerns of Rolm are representative: "[A] channelization plan championed by the FCC could influence technology standards, i.e. bias one technology versus another. By not giving developers sufficient latitude in spectrum usage, innovative implementations may be stifled."[68]

Finally, parties also have agreed generally that clear spectrum is required for the deployment of unlicensed devices.[69]

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[65] BellSouth at 25-26; Ericsson at 22-23; Metrocall at 20; North American Telecommunications Association at 9; Rolm at 10-13; TIA at 7-8; WINForum at 12-14.

[66] WINForum at 12.

[67] BellSouth at 24-25; Corporate Technology Partners at 9; Interdigital at 8-10; Comments of Knowledge Implementations, Inc. at 4-6; North American Telecommunications Association at 8-9; Matsushita at 5-6; Metrocall at 20; Comments of Pacific Communications Sciences, Inc. at 16; Rolm at 10-13; Comments of Chandos A. Rypinski at 2-10; Comments of Tadiran at 5-13; WINForum at 12-13; Comments of Xircom Corporation at 3.

[68] Rolm at 12-13.

[69] Ameritech at 12; Andrew Corporation at 6; Comments of Apple Computer, Inc. at 4; California Microwave at 2; Hewlett-Packard at 1-2; Comments of IEEE Project 802, Local and Metropolitan Area Network Standards Committee at 9; North American Telecommunications Association at 10; Northern Telecom

While clear spectrum is needed in order to achieve the mass market, consumer potential for unlicensed devices, early deployment of certain stable installations, such as fixed wireless PBX and LAN systems, does appear possible, using coordination to avoid interference with incumbents. Such an interim, provisional sharing arrangement (which would expire upon completion of band clearing) could provide a critical start-up opportunity, and enable unlicensed PCS proponents to begin generating a revenue stream to finance the relocation of incumbents.

V. TELOCATOR'S SUGGESTED INDUSTRY MECHANISM FOR RELOCATING 2 GHz MICROWAVE LICENSEES IN THE 1910-1930 MHz UNLICENSED DEVICE BAND SHOULD BE PURSUED

The Commission's recent action in the emerging technologies rulemaking contemplates that providers of unlicensed devices must provide cost compensation for the relocation of 2 GHz microwave licensees. In its opening comments, Telocator recommended that an entity assume relocation obligations on behalf of the unlicensed device industry. The opening comments indicate broad support for this idea.[70] Motorola has explained the need for such a compensation mechanism:

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at 18; WINForum at 3-5.

[70] AT&T at 13-14; California Microwave at 3; Comments of Edison Electric Institute at 5 ("Edison Electric Institute"); Hewlett-Packard Company at 2-3; Comments of Hitachi Telecom (USA), Inc. at 8; Motorola at 42; North American Telecommunications Association at 12-13; Northern Telecom at 18-19; Rolm at 21-22; UTC at 19.

> [B]and clearing of the entire country is necessary for effective introduction of new [unlicensed PCS] offerings. The buyers or users of equipment control where and how the devices are used . . . . Thus, there is a constant possibility of unanticipated interference to 2 GHz operations unless and until all current microwave uses are migrated to other bands.[71]

The industry is moving forward with active discussions on how to organize, fund, manage, and implement such an entity.

A large number of commenters also supported Telocator's recommendation that the Commission use its authority over spectrum authorization or equipment approval to ensure the participation of unlicensed PCS providers in relocating incumbent users.[72] The Commission's authority in these matters may represent the only common "gateway" through which all unlicensed providers must pass. Many commenters have acknowledged that without such a process for ensuring cost contribution, efficient and fair relocation may be difficult, if not impossible. The comments of the Edison Electric Institute exemplify these concerns: "[T]he only method by which existing users can be assured of reimbursement of relocation expenses is if all manufacturers/vendors of unlicensed PCS equipment are required to join a consortium that guarantees the costs of 2 GHz relocation prior to FCC equipment certification."[73]

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[71] Motorola at 41-42.

[72] Comments of American Petroleum Institute at 17-18; Edison Electric Institute at 5; Motorola at 42; Comments of Pennsylvania Public Utility Commission at 10; Rolm at 21-22; WINForum at 11.

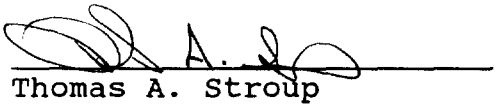
[73] Edison Electric Institute at 5.

VI. CONCLUSION

Telocator urges the Commission to adopt PCS rules consistent with the basic principles set forth above. In so doing, the Commission will promote its important goals of universality, speed of deployment, diversity, and competition in the provision of PCS. By adopting the consensus views of the PCS industry, the Commission can build a solid foundation for the rapid and efficient implementation of PCS.

Respectfully submitted,

TELOCATOR, THE PERSONAL COMMUNICATIONS INDUSTRY ASSOCIATION

By: 

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APPENDIX A

TE/92-07-09/104

PERSONAL COMMUNICATIONS SERVICES (PCS)

STANDARDS REQUIREMENTS DOCUMENT

SERVICE DESCRIPTION STANDARDS

REV 5

July 9, 1992

Prepared jointly by,

Telocator PCS Marketing and Consumer Affairs Committee

and

Telocator PCS Technical and Engineering Committee

Table of Contents

2 Introduction

The Telocator PCS section membership recognizes that standards are critical to the successful implementation of PCS. This document represents a consensus view of the manufacturers, current and future telecommunications providers and others who make up the Telocator PCS section. A list of member companies is attached as appendix A.

The purpose of this document is to advance a set of mandatory and desirable capabilities and attributes that PCS standards should encompass from a user's and/or a service provider's perspective.

This document describes three areas of standardization that are needed by the PCS industry. These three areas are:

- Uniform Service Description Standards (Section 5)

    * It is important to recognize that the service standards requirements listed in this section are person-centered (not device-centered) and proposed to be uniform across all PCS networks, both wired and wireless. The implementations of these services should be as generic and uniform as possible.

- Standard Terminal Requirements for Wireless PCS Handset and Terminal Adapters (Section 6)

- Detailed Service Descriptions for Wireless Handset and Terminal Adapters (Section 7)

The philosophy adopted in this document is to provide conceptual guidelines in lieu of quantitative objectives. It was felt that the development of these numeric objectives is more appropriately done in the standards bodies.

The details of how these standards are packaged into standards documents will be left to the standards bodies responsible for the development of the standards.

In addition, this document is intended to be a working document subject to revision based on feedback from the standards bodies and based on continuing efforts in the industry.

The Telocator PCS Service Descriptions document is included as Appendix C.

3 Market Research Study

The PCS Demand Forecast was prepared by the Customer Requirements Subcommittee of the Telocator Marketing and Consumer Affairs Committee. It represents market size estimates that the Telocator PCS Section determined would be essential to understanding the scope and the nature of any PCS service. Further, it also attempts to gauge the impact of competition among new services as well as their impact on existing services and, finally, to estimate the impact of a delay in FCC licensing of emerging services on market size estimates.

The entire document is contained in Appendix B.

4 PCS Definitions

4.1 Authentication - the process of verifying the identity of a user or terminal attempting to interact with the network. [T1P1]

4.2 Call Management - the ability of a user to indicate to the network how to handle incoming calls according to certain parameters such as the originator of the call, the time of day and the nature of the call. [CCITT]

4.3 Encryption - a treatment applied to signaling or data which prevents an unauthorized detector of the data from extracting information. [T1P1]

4.4 Handover - re-routing the radio portion of a call without interruption of the call for signal quality reasons, traffic management reasons, or any other reasons. [T1P1]

4.5 Personal Communications Service - a set of capabilities that allows some combination of terminal mobility, personal mobility and service profile management. [T1P1]

4.6 Personal Communications Services - a broad range of individualized telecommunications services that enable people or devices to communicate independent of location. [Telocator]

4.7 Personal Communications System - a combination of facilities which provide some combination of terminal mobility, personal mobility, and service profile mgmt.[T1P1]

4.8 Service Profile **Database** - a repository for information related to a set of subscribers and users for the purpose of providing personal service. [T1P1]

4.9 Personal Mobility - the ability of a user to access telecommunications services at any terminal on the basis of a unique personal identifier, and the capability of the network to provide those services according to the user's service profile. [CCITT]

4.10 Personal Number - a number that uniquely identifies a personal user and is used to reach that user. A user may have more than one personal number for different applications. [CCITT (UPT)]

4.11 Personal Registration - the process of associating a user with a specific terminal. [T1P1]

4.12 Personal Routing Address [physical address] - a number used by the network to direct a call according to the user's service profile. [CCITT]

4.13 Personal Subscriber (subscriber) - a person or entity who, or which, obtains a personal service from a service provider on behalf of one or more users and is responsible for payment of the charges due to that service provider. [CCITT (UPT)]

4.14 Personal Terminal - a light-weight, pocket-sized portable terminal providing the capability for the user to be either stationary or in motion while accessing and using telecommunication services. A personal terminal can be implemented as a handset or a WTA (4.23). [T1P1]

4.15 Personal User (user) - a person or entity who, or which, has access to personal telecommunications services and has been assigned a personal number. [CCITT (UPT)]

4.16 Service Profile - a record containing all the information related to a personal user in order to provide that user with a personal service. [CCITT (UPT)]

* **NOTE:** Each service profile is associated with a single personal number.

4.17 Service Profile Management - the ability to access and manipulate the user's service profile. [CCITT (UPT)]

4.18 Sharing - the ability to coexist with the current users of a given block of spectrum. [Telocator]

4.19 Terminal Mobility - the ability of a terminal to access telecommunications services from different locations and while in motion and the capability of the network to identify and locate that terminal. [CCITT]

4.20 Terminal Number - a number that uniquely identifies a terminal and is used to reach that terminal. [Telocator]

4.21 Terminal Registration - the process of associating a terminal with a routing address. [T1P1]

4.22 Universal Personal Telecommunications Service [UPT] - a service which provides personal mobility and service profile management. [CCITT]

4.23 Validation - the process of verifying that a user or terminal is entitled to access services. [T1P1]

4.24 Wireless Personal Terminal (WPT) - a tetherless device that provides communications capability via a common air interface. [Telocator]

4.25 Wireless Terminal Adaptor (WTA) - terminal adaption equipment providing the radio link for external modem data (i.e.,fax, dial-up computer) or digital data (i.e., computer). The terminal connections will be standard (i.e., RJ11, RS232, etc.). [Telocator]

5 Requirements for Uniform PCS Service Description Standards

NOTE: the service standards requirements listed in this section are person-centered and proposed to be uniform across all PCS networks, both wired and wireless. The implementations of these services should be as generic and uniform as possible.

5.1 COMPATIBILITY

NOTE: Where no services are listed, handset features apply to all services. Where services are noted in bold capital letters, only noted services apply: **T**-telepoint; **AT**-advanced telepoint; **PTS**-personal telecommunications service; **AC/WB**-advanced cordless and wireless business; **MS**-mobile satellite.

5.1.1 Network interworking - network standards, whether wireless or landline, must be designed with a common signaling protocol and open standards in order to insure compatibility in interconnection for call origination, delivery, management, termination, billing, handover and to provide a truly seamless roaming functionality.

5.2 Call Processing Features and Services

5.2.1 Advice of Charging: Provides the billed subscriber with charging information for telecommunications services used.

5.2.2 Charge Notification: Provides notification to the caller that the user is roaming somewhere other than the user's home system and an additional charge will be incurred upon call completion. The caller would *then* have the option whether or not to complete the call.

5.2.3 Automatic Charge Reversing: Allows the user having one or more installations to be reached from all or part of the country and be charged for the call.

5.2.4 Call Forwarding: Permits the user to send all incoming calls addressed to the called user's personal number to a third party (e.g., voice mail, secretary, alternate number, etc.). Users should be able to specify that a call should be forwarded:

* upon completion of a specified number of rings
* if the called party is busy
* immediate forwarding

Call forwarding could be based on the personal or terminal number, in which case the service would be called Call Forwarding-Personal or Call Forwarding-Terminal.

5.2.5 Call Hold: Allows a user to interrupt communications on an existing call and then subsequently, if desired, reestablish communication.

5.2.6 Call Transfer [for use by AC/WB]: Enables the user to transfer an established incoming or outgoing call to a third party.

5.2.7 Call Waiting: Notifies the user of an incoming call while the user is already engaged in conversation on a prior call. The user can either answer, transfer the call to a third party (e.g., voice mail, secretary, etc.) or ignore the new incoming call.

5.2.8 Closed User Group: Allows a group of users, connected to a network to intercommunicate only with themselves and, if required, one or more users may be provided with incoming/outgoing access to users outside this closed group.

5.2.9 Conference Calling: Provides a user with the ability to have a multi-connection call, i.e., a simultaneous communication between more than two parties.

5.2.10 Extension Phone Service (First Page Answer) [for use by AC/WB]: Provides access to multiple users with individual numbers by the use of a pilot directory number. Whenever a call is placed to the pilot number, all the numbers in the multiple number list are paged at once, and the first user to answer the page is the only handset to be connected to the calling party. This service could be based on personal or terminal numbers.

5.2.11 Call Distribution [for use by AC/WB]: Enables incoming calls to be distributed over a group of numbers (either personal or terminal) belonging to a PBX.

5.2.12 Three-way Calling: Provides the user with the capability of adding a third party to an established two-way call.

5.2.13 Priority Access and Code/Channel Assignment: Allows a handset or terminal adaptor with a specified (preset by system operator) class of service to have priority access to radio codes/channels on call origination. There should be multiple levels of priority.

5.2.14 Reverse Charging: Allows a called user to be charged for the call on a per-call basis, at the caller's request and with the called user's permission.

5.2.15 Voice Privacy (encryption): An optional encryption feature which should provide an increased degree of privacy for the user over the radio link.

5.2.16 Incoming Call Screening: Provides for alternate routing, blocking or allowing of specified incoming calls based on personal or terminal number presentation.

5.2.17 Authorization Code: Allows a user to dial a private authorization code to increase the privileges available to the subscriber, i.e., lessened Outgoing Call Barring criteria.

5.2.18 Do Not Disturb: Allows a subscriber to dial a Do Not Disturb code to bar call delivery to subscriber's handset. This feature could be used in conjunction with unrestricted call forwarding.

5.2.19 "911": Allows a user to dial "911" and be connected to emergency authorities. This service may interface directly with the landline network 911 connection where available or can perform number translation similar to speed dialing where landline 911 is not available.

5.3 Call Management Services - basic call signaling services utilizing out-of-band signaling to transmit information about an originating call:

5.3.1 Automatic Callback: If the called party is busy, this feature autonomously dials the number of the last incoming call and calls the invoking user back when the called party becomes free.

5.3.2 Automatic Recall: If the called party is busy, this feature autonomously dials the number of the last outgoing call and calls the invoking user back when the called party becomes free.

5.3.3 Call Pick-up: [for use by AC/WB] Allows user to redirect to his handset calls addressed to another device.

5.3.4 Calling Name/Number Identification Presentation: Displays the name/number of the incoming call on a display screen located on the handset or on an adjunct unit.

5.3.5 Calling Name/Number Identification Restriction: Restricts the display of the calling party's name/number on the called party's display.

5.3.6 Data Number: To send data or video to a user the calling party dials the user's personal number and a data base look-up provides data, fax or video number translation. This process should be linked with the ESN of the user's wireless device.

5.3.7 Call Trace: Allows the wireless service provider or the user to trace a call.

5.3.8 Distinctive Alerting/Call Waiting: Allows the user to preselect numbers to ring with a distinctive sounding ring or call waiting tone.

5.3.9 Message Delivery: Provides to the caller a messaging service routing number so that messages can be delivered/stored. When the user number is busy, no answer, or not registered, calling party has the option to leave a message that may be stored for later delivery.

5.3.10 Multi-Level Precedence and Preemption (MLPP): Provides prioritized call handling capabilities.

5.3.11 Message Waiting Notification: Notifies a user that a voice message is waiting.

5.3.12 Selective Call Acceptance: Allows the user to preselect numbers which will be presented to the user's terminal.

5.3.13 Selective Call Rejection: Allows the user to select certain numbers to be blocked. Caller to receive a reorder tone.

5.3.14 Selective Call Forwarding: Allows the user to preselect certain numbers to forward to a third party.

5.3.15 User Profile Editing: Allows a user to view, modify, activate and deactivate features and services contained in his service profile. This profile will be maintained in the HLR and can be edited either via the user's home switch or a remote switch. The following services are examples of features able to be modified in the user profile:

* Distinctive Alerting/Call Waiting
* Selective Call Acceptance
* Selective Call Rejection
* Selective Call Forwarding

5.3.16 Signaling: Network must supply to and receive from the handset or terminal adaptor, the appropriate signaling capable of supporting such features as smart card, locally generated dial and busy tones, call waiting tones, distinctive ringing, display-based telephony, etc - where appropriate.

5.3.17 Other Landline Network Services: It is desirable that, where appropriate, features and services offered currently or in the future by the landline network be supported in the wireless networks.

5.4 Call Progress Management

This section is intended to cover requirements, from a user's prospective, related to actions that should occur in the network, in the terminal, or both, to manage certain events that may happen in any of the various call phases.

An example is: what action should be taken when a wireless handset moves out of range? Should the call be dropped? If so, after how long? Is reconnection allowed? Should the caller be alerted?

[TO BE SUPPLIED]

5.5 Authentication and Validation (A & V)

5.5.1 Provides authentication (identification) of the *user* for billing and accounting purposes.

5.5.2 Provides validation of the terminal device and the user to ensure the viability of both the user and the device being used. This process can be combined, as in the minimum handset requirement, or separately , as required in the enhanced handset or terminal device.

5.5.3 In certain network implementations, A&V may not be required.

5.6 Transmission Features

PCS will provide flexible and transparent service to data users. These services will be provided using standardized interfaces, recognized synchronous and asynchronous data link protocols, network interworking functions, and standardized signaling protocols for configuration. While Wireless LAN (WLAN) applications are part of a generic PCS description, they are not included in this document at this time.

5.6.1 Data Circuit Duplex Asynchronous 1200-9600 bps; Network support required for backward compatibility.

5.6.2 Data Packet Duplex Synchronous 1200-9600 bps: Network support required for backward compatibility.

5.6.3 Facsimile Transmission Group 3: Network support required for backward compatibility.

5.6.4 Facsimile Transmission Group 4: Network support optional.

5.6.5 Packet Assembler/Disassembler (PAD) Access Circuit Asynchronous 1200-4800 bps: The network will provide a duplex, asynchronous data connection between the data terminal connected to a terminal, handset or wireless terminal adaptor and the PAD function connected to the PSTN. For example, the data terminal interacts directly with the PAD using protocols such as X.3, X.28, X.29, etc (as appropriate).

[OTHER DATA SERVICES TO BE DEFINED]

NOTE: Data of good quality will require some form of error correction. This correction may result in reductions in data throughput. There may be cases where higher data rates are more important than that data being error free. Some provision for raw (uncorrected) data might be desirable.

5.6.6 Various Speech Rates: Future enhancement for additional spectral efficiency.

5.6.7 Speech Transmission: TBD

5.6.8 Short Message Transmission: Allows exchange of short messages between a handset and the wireless system and between the system and a dedicated device capable of transmitting and receiving short messages.

5.6.9 STU-III Service: Allows for interoperability between existing STU-IIIs (the U.S. Government's secure voice and data terminals) in the PSTN and compatible Government secure mobile stations when communicating in STU-III service modes.

5.6.10 Teletex: TBD

5.6.11 Tone Transmission: Required to support Dual Tone Multi-Frequency (DTMF) tones (continuous and burst) and Call Progress tones in both directions.

5.6.12 User-to-User Signaling: Allows a user to send/receive a limited amount of information to/from another network or user.

5.6.13 Videotex: TBD

5.7 Feature Codes: User control of certain wireless system features is provided through the use of Feature Code Strings sent by the user to the serving carrier's system. It is recommended that all feature, service, and carrier specific codes be standardized, with a goal of consistency between emerging Personal Communications Services, cellular and landline networks.

5.8 Security

5.8.1 Enhanced Privacy: Users may feel uncomfortable with wireless devices because of the worry of others intercepting their communications. The system should provide means of enhancing privacy. One possible implementation might be to encrypt all signaling and subscriber information between the personal terminal and base station. Another would be to allow for easy attachment of external encryption equipment.

5.8.2 Fraud prevention: The authentication and validation process should permit the system operator to detect fraudulent wireless devices and /or unauthorized users before service is granted. This prevention should extend to both circuit- and packet-switched data, as well as for speech.

NOTE: In some network implementations, the above security features may not be required.

6 Requirements for Wireless PCS Handset and Terminal Adaptor Standards

6.1 Quality and Performance

The performance goal of PCS is to provide a grade of service comparable to consumer expectations of landline telephone service, although quality may vary due to technology differences. The user should perceive PCS to be similar in performance to "Plain Old Telephone Service" (POTS) - rather than current mobile telephony - with respect to sound quality and data performance.

NOTE: Where no services are listed, handset features apply to all services. Where services are noted in bold capital letters, only noted services apply: **T**-telepoint; **AT**-advanced telepoint; **PTS**-personal telecommunications service; **AC/WB**-advanced cordless and wireless business; **MS**-mobile satellite.

6.1.1 Audio

6.1.1.1 Voice Quality

6.1.1.1.1 should be comparable to landline, with a minimum requirement of a significant improvement over existing analog cellular.

6.1.1.1.2 user should be able to hear in a noisy environment such as an airport or urban street.

6.1.1.1.3 artifacts of voice digitization algorithm should sound like the traditional background noise from landline telephony.

6.1.1.1.4 should support voice band modems at a rate of at least 2.4 kb/s and Group III fax.

6.1.1.1.5 background noise feedback should be minimized so as not to interfere with or make conversation unintelligible.

6.1.1.1.6 listener should be able to recognize the PCS user's voice.

6.1.1.1.7 quality should be quantified by echo, delay, frequency response, distortion, etc.

6.1.1.2 Music - handset and network should be capable of carrying recognizable music comparable in quality to landline for such applications as "music on hold".

6.1.1.3 Noise - any noise introduced by the wireless network should be minimized. One example where noise could be a problem is "Meet-me conferencing"

6.1.2 Data Transmission Rates and Quality - PTS,AC/WB,MS

PCS will provide flexible and transparent service to data users. These services will be provided using standardized interfaces, recognized synchronous and asynchronous data link protocols, network interworking functions, and standardized signaling protocols for configuration. While Wireless LAN (WLAN) applications are part of a generic PCS description, they are not included in this document at this time.

Requirements for Data Options:

6.1.2.1 Handset and/or wireless terminal adapter must support at least 2.4 kb/s modem modulated data and existing Group III facsimile machines.

6.1.2.2 Handset and/or wireless terminal adapter should, at a minimum, support low speed (19.2 kbps) digital data in a mobile environment with a goal of supporting medium (144 kbps) digital data speeds.

6.1.2.3 Data support can be either integrated into a personal terminal or external through standard access connections (e,g, RJ11 for modem and fax or RS232 for digital data)

6.1.2.4 Bit Error Rate (BER), after error correction, should be comparable to the BER for existing analog and digital landline data transmission such that use of existing terminals and computers are not excluded.

6.1.2.5 Bearer channel bit count integrity (synchronization) must be maintained across handovers and expected periods of fading. This is important for synchronous data services and many encryption techniques.

6.1.2.6 The technology used should not preclude the ability to provide simultaneous voice and data within a single personal terminal.

[ADDITIONAL WORK TO BE DONE ON DATA]

6.2 COMPATIBILITY

6.2.1 Spectrum Sharing - the ability to share spectrum is a critical measure of the technology chosen because the inability to share will delay the start of service. (Reference sharing document, CAI SRD, part 16 document)

6.2.2 Backward compatibility - the wireless network must be able to support existing terminal devices (e.g. facsimile, computer modems and landline telephone sets).**PTS,AC/WB,MS**

6.2.3 Handsets - service-specific handsets should be as compatible as possible and be able to access different networks through a minimum number of Common Air Interfaces (CAI). It is recommended that a single Common Air Interface across different services not be precluded.

6.3 FEATURES

NOTE: Most handset features should be determined by users and manufacturers, not by recognized standard-setting bodies. Each service will have a unique set of minimum and enhanced features. A wide range of additional or enhanced features and capabilities can be implemented at the discretion of the manufacturers as required by customer demand. Manufacturers, however, might want to implement certain enhanced features in accordance with industry standards. The radio and network interfaces must provide the necessary signaling and intelligence required to support both basic and enhanced features on a service-specific basis.

Standardized handset features are required to provide a minimum level of functionality. Some enhanced features require a minimum network capability. For example, although an alphanumeric display is not expected to be required for basic Telepoint service, the ability to transmit data to an alphanumeric display must be included as a required function of the network. The following table describes handset features which are either required for minimum service functionality (Basic) or might be desired by the customer as an enhanced capability (Enhanced). Note that a minimum functionality terminal must be capable of operation in an enhanced application base and vice-versa.